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The Acute Abdomen in Africans —The Approach of a Physician

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While this is, strictly speaking, the province of the surgeon, physicians should be able to help in the differential diagnosis. It is necessary for them to know something about the different incidence of acute abdominal disease in Africans, also of the ways in which it may be simulated by other medical complaints, such as bacillary dysentery or sickle-cell crises. It is also necessary to be able to recognise unusual abdominal complaints, but ones met frequently in certain parts of Africa; recurrent volvulus and subacute intussusception in adults.

Gynaecological Conditions and Trauma

In most hospitals gynaecological conditions are the commonest cause of a major abdominal emergency; thus in Johannesburg they accounted for 34 per cent. of 1,303 major abdominal operations (Hammar and Aldis, 1950). It is seldom that a physician is asked to see these cases. Neither will he often see patients admitted because of recognised trauma to the abdomen, with the possible exception of a ruptured spleen, for then injury may have been but slight. In the South African series already quoted, trauma, largely homicidal penetrating wounds, accounted for 18.1 per cent. of the laparotomies, but are a negligible proportion at Kampala, Uganda (Burkitt, 1952).

The Acute Abdomen

Tropical Africa

Excluding gynaecological and traumatic conditions and confining attention to acute surgical emergencies in the abdomen, it can be seen that the pattern seen in Africans in tropical countries differs considerably from that of Europe and America (Burkitt, 1952) (Table I). Thus in advanced groups, inflammatory disease, especially of the appendix, accounts for three-quarters of the urgent laparotomies in Europeans; these are less common in Africans, especially in the tropics. In the latter it is the obstructive group, not only external hernia, but also both volvulus and intussusception in adults, which form nearly nine-tenths of the cases; on the other hand, carcinoma of the colon is uncommon. Europeans have much more perforated peptic ulcer than Africans, but the latter have more rupture of the spleen.

As far as can be ascertained, this pattern holds, at least in its broadest aspects, for West Africa and the Belgian Congo, but in the larger towns of South Africa the incidence of acute appendicitis and perforated ulcer rises, while that of the bowel obstruction tends to fall.

Central Africa and South Africa

In these areas the position is rather intermediate between that seen in Africans in the tropics and that encountered in Europeans and Americans in all areas of the globe, including the warmest parts of Africa. Thus at Salisbury, excluding gynaecological conditions, the commonest abdominal emergencies have been strangulated hernia 19 cases, acute appendicitis 14, volvulus 10, ruptured spleen 9, liver abscess 7, intussusception 1, splenic abscess 1 (Gelfand, 1957). There is less ruptured spleen in South Africa and liver abscess is infrequent, save around Durban, where it is probably more common than anywhere else in the world.

The Inflammatory Group

Acute Appendicitis

It is not proposed to discuss this surgical condition in any detail, but to mention only a few points. Firstly, there appears to be a good deal to suggest that the incidence of acute appendicitis was formerly very low among Africans of

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Table I

ACUTE ABDOMINAL EMERGENCIES IN UGANDA AND ENGLAND

(Stated as on a per cent. basis and excluding trauma and gynaecological cases)

	Uganda	*England*
Inflammatory—		
Appendicitis	1.3	74.3
Others	1.3	0.3
TOTAL	2.6	74.6
Obstructive—		
Hernia	73.0	9.0
Volvulus	9.7	—
Intussusception	3.7	0.3
Carcinoma, colon	—	1.7
Mesenteric thrombosis	1.0	0.3
TOTAL	87.4	11.3
Perforations and Ruptures—		
Perforated peptic ulcer	—	10.3
Ruptured spleen	1.7	0.3
Others	—	3.2
TOTAL	1.7	13.8

all rural areas, and until recently even in the towns. Like all negative evidence, this may not be incontrovertible and none of it can be evaluated statistically. Nevertheless, it is very strong, as shown by the great infrequency of this disease as a cause of death in large series of autopsies in Nairobi and Lagos; in Kampala, a rather small town, most Africans living in the surrounding countryside, the incidence would appear to be stationary. Also the disease was very seldom seen by surgeons or doctors accustomed to hospital practice except in the largest towns. It is still an uncommon disease in many parts of Africa. It is possible that the incidence of acute appendicitis is rising, especially in the larger towns of all parts of Africa. Thus it accounts for 14.1 per cent. of laparotomies at Ibadan (Joly and Thomas, 1954) and cases are met frequently at Brazzaville (Grosperrin and Maurice, 1943) and in the towns of Rhodesia (Gelfand, 1957) and of South Africa (Erasmus, 1939).

It has been suggested that articles of the European diet, possibly bread, encourage pathogenic organisms in the caecum. Sugar is consumed in large amounts by all Africans in all areas of Africa; neither it nor meat are likely causes. More information is needed concerning the influence of other foods, such as rice and potatoes, on the incidence of this important disease. Little is known concerning whether the lumen of the appendix remains more patent under certain dietary patterns. In spite of many claims, it is doubtful if infection of the organ by bilharzia, amoebae or other parasites contributes at all to acute pyogenic appendicitis in Africans. The incidence of appendicitis is approximately equal in negroes and whites in the United States.

When appendicitis occurs the clinical picture is similar, save that some have suggested that general peritonitis is in certain tropical areas less common (Falconer, 1956). The differential diagnosis in the early stages must be from dysentery and salmonella infections, all varieties of helminthiasis and intussusception of the caecum, as seen in African adults.

When an inflammatory mass has occurred one must bear in mind amoebiasis of the caecum, possibly perforating, impacted roundworms, and intussusception in an adult and salpingitis in a woman. A pelvic appendix causing diarrhoea can be a difficult diagnostic problem in areas where there is much dysentery, bilharzia and diarrhoea.

The treatment of appendicitis follows the usual lines and is essentially surgical.

Acute Cholecystitis and Cholelithiasis are both less common in Africans than Europeans; gallstones become more frequent as age advances and are always more common in females. In Johannesburg, Becker and Chatgidakis (1952) found stones present in 30 per cent. of European women over 60 years, but in only 3 per cent. of African women of similar age.

Active Non-Specific Mesenteric Lymphadenitis

This is one of the commonest acute abdominal diseases in Europe and America, children especially being attacked, and among them it is commoner than acute appendicitis. The lymph glands along the mesenteric attachment of the lower part of the ileum are acutely inflamed, but do not suppurate. The cause is not known; no bacteria or viruses have been identified. The histological changes in the glands are identical to those seen in regional ileitis; possibly there is some connection between these two diseases.

The clinical picture resembles that of acute appendicitis; there are bouts of very severe abdominal pain and colic, separated by intervals between which the child is surprisingly well. It is impossible to establish the diagnosis apart from laparotomy. Attacks are apt to recur. In Africa, apart from appendicitis, the differential diagnosis would be from the colic of an incipient dysentery or from helminthiasis; at operation a gland biopsy may be demanded to distinguish tuberculous infection.

This disease appears very rare or is seldom diagnosed among Africans. Thus it is seldom encountered at Mulago Hospital, Kampala, Uganda.

Obstructive Group

This is the predominant group of acute abdomen in most areas of Africa, if gynaecological, traumatic and suprapublic operations are excluded. It is especially this group that physicians may be asked to see, and they should be acquainted with some of its peculiarities (Table II). At Ibadan, Nigeria, obstruction accounts for 85.9 per cent. of the acute abdomens (Joly and Thomas, 1954); at Kampala, Uganda, for 94.2 per cent. (Burkitt, 1952); but in Johannesburg obstructive lesions are only about 10 per cent. (Hammar and Aldis, 1950); this is largely due to the frequency of abdominal wounds.

Hernia

It is the very high incidence of strangulated inguinal hernia which is responsible for most cases of obstruction in tropical Africa. There is much to suggest that the incidence of hernia varies considerably from one tribal group to another, whether in Kenya (Miller, 1955) or Uganda. Thus at Mulago Hospital, Kampala, Ganda get about seven times as many hernia as Ruanda, due allowance being made for the size of the tribal groups admitted (Ashley, 1954). More detailed surveys are required in terms of sex and age, for inguinal hernia rises in frequency with increasing years. The proportion of men to women in the Kampala series of inguinal hernia is approximately 7.7: 1, much as it is in other parts of the world. Earlier reports (Manuwa, 1928-29; Connell, 1930) that African women were almost immune are incorrect and reflect more the reasons which prevented the female sex from seeking medical aid. Similarly, the supposed undue rarity of femoral hernia has not been upheld by certain recent studies; there are 21.6 inguinal to one femoral hernia in Mulago hospital.

Among inguinal hernia the high proportion of direct hernia has been stressed by certain authors—their number approximates to that of the indirect variety—whereas in Europeans the proportion is about six to one. Laxity of the mesenteric, retro-peritoneal and other abdominal connective tissues seem certain; it has been suggested that it is due to oestrogen imbalance. About 8 per cent. of the inguinal hernias are of the sliding variety and include caecum, sigmoid colon or bladder—another manifestation of relaxed tissues.

Umbilical Hernia

This is considered for convenience here, although in Africans obstruction is very rare, yet it is the fear of this which renders the condition of interest to paediatrician and physician. There are said to be two varieties: congenital (infantile) and acquired (adult).

The *infantile variety* in Africans is almost always of the "skin type," in which the umbilical cord stops about half an inch away from the abdominal wall, being joined by tubular projection of peritoneum-lined skin. There is considerable evidence that this hernia is present in the large majority of African children at birth, both in all parts of Africa (Jelliffe, 1952, 1954; Mack, 1945; Skapinker, 1953) and in the United States and the West Indies. In Nigeria it is present in 90 to 97 per cent. at birth and slowly but regularly decreases throughout the period of growth to an incidence of 10 to 27 per cent. in adults, the higher figure being found in the lower income groups. Most hernias

Table II

Varieties of Acute Obstruction
(Per cent. at laparotomy)
Any sub-variety, if predominating, is listed in brackets

	Johannesburg		*Salisbury*	*Kampala*	*Ibadan*	*London*
	Skapinker	Hamman and Aldis	Gelfand	Burkitt	Joly and Thomas	Vicks
Hernia	40.6	37.5	63	77	38.7	49
Volvulus	15.3 (sigmoid)	7.3 (sigmoid)	33 (sigmoid)	10.1 (sigmoid)	1.0	2.5 (small intestine)
Intussusception	10.0 (adult)	11.8	3	3.8	21.5 (adult)	14.9 (infantile)
Bands and adhesions	16.7	24.5	—	7.4	—	8.8
Colon carcinoma	—	3.6	—	—	—	12.8
Ascaris	4.7	2.7	—	—	—	—

are small; they may be palpable only on coughing (grade 1) or they may admit only the tip of the little finger (grade 2). Large bulky protrusions, however, are often seen in children and they may even become pendulous. The diameter of the neck is large and usually bears some relationship to the size of the sac, but no reference has been traced to a detailed consideration of the anatomical features in childhood and adult life. One thing seems clear: untoward symptoms almost never occur; the hernia is easily reducible, however large. There is only one report of a strangulated infantile umbilical hernia in an African infant (Heywood and Youngleson, 1957). No treatment is usually required; most hernias subside to negligible proportions in adult life, but operation should be recommended for cosmetic reasons if the sac remains very large in adolescence.

The *adult variety*, as seen in Europe, is considered to be an acquired condition; it is commoner in obese middle-aged women. It tends to enlarge progressively, and it often contains irreducible bowel and omentum, so that dragging pain is always present and obstruction frequently occurs. It is a dangerous condition and should be treated, if possible, always by operation. Owing to the great frequency in Africans of the persistence of the infantile variety into adult life, hernias should be regarded as of the congenital variety unless the history is unimpeachable or they become irreducible or progressively enlarged in middle age; these suggest the adult variety and are indications for operation. Many surgeons have never seen a strangulated umbilical hernia in an African; reports of a few cases, however, occur (Hammar and Aldis, 1950; Heywood and Youngleson, 1957). Both femoral hernia and umbilical hernia tend to be diseases of stout middle-aged women; possibly this somatic type is less common in many tribes and social groups in Africa and may explain the infrequency of the diseases, at least in tropical Africa, but in South Africa stout middle-aged African women are commonly seen.

Bands and Adhesions

Apart from the infrequency of acute appendicitis and perforated peptic ulcer in Africans, with resultant bands and adhesions, this group calls for no comment. The incidence appears to vary much in various parts of Africa (Table II), but also does so in reports published from England and the United States.

Carcinoma of Large Bowel

The infrequency of colonic cancer is striking (Table II); it is a feature of all parts of Africa. In passing, it may be noted that cancer of the anus is also less common than in Europe and America, but rectal stricture, following poradenitis in women, may be encountered. As subsequently mentioned, the colon of the African adult is commonly obstructed by volvulus and intussusception.

Perforations

Perforated peptic ulcer is uncommon in Africans. Typhoid ulcers may perforate. In my experience there are two varieties: those which occur in severe cases usually in the third week, these may have masked signs in severely toxic

cases; but in another group perforation may be the presenting sign in one who was ambulant and ailed little until this catastrophe occurred. Perforation of an amoebic ulcer may occur in the colon, but that of diverticulosis has not been recorded in an African; the latter disease is rare even in elderly Africans. On rare occasions ascaris can perforate the bowel.

Rupture

Rupture of the spleen is relatively common in all areas of malaria (Gelfand, 1957). Some splenomegaly precedes the haemorrhage and trauma has usually been present, but may have been but mild.

Heavy Ascaris Infection

When ascaris infection is light, say, under 20 worms, only mild abdominal discomfort is felt; indeed, nothing may be reported until a worm is noted in the stool. Examination of the latter always reveals ova, as the female worm is very prolific. All this constitutes the usual description of roundworm disease and does not prepare one's mind for the picture seen in heavy infection. The latter is usually associated with malnutrition and a poor social position. It is commonest from the age of one to six years. Its incidence varies much from one area of Africa to another, but whereas hookworm is often common in the damp tropical regions, ascaris is found in drier areas which may even have a temperate climate (Hammar and Aldis, 1950; Skapinker, 1953; Romberg, 1953).

Clinical Picture (Silva, 1957).—The child is usually brought because of some episode of abdominal discomfort, diarrhoea and vomiting, and worms may be lost from either end of the alimentary tract. This episode of an acute illness is superimposed on a period of indifferent health; and while this may be due entirely to the roundworms, yet some fever, or even more, an abdominal illness should be feared: dysentery, diarrhoea or appendicitis. This may easily be overlooked.

Surgical complications may arise in heavily infected children and are those of *partial obstruction*, which may become complete, the commonest site being the lower ileum. This is apt to occur following treatment with a vermifuge. In partial obstruction there is a history of several days of severe colic and vomiting; some diarrhoea occurs as frequently as constipation (Heywood and Youngleson, 1957). Distension is usually absent. In over two-thirds of the cases one or more palpable lumps are felt towards the centre of the lower half of the abdomen. This mass seldom has the appropriate shape or position of an intussusception and the child is older and the history longer, and there is never blood in the stool. Cases of partial obstruction can usually be cured by giving frequent doses of liquid paraffin and tincture of belladonna by mouth and saline enemata; these should be tried before recourse to piperazine.

Complete obstruction is considered present if there is no motion of the bowels, severe vomiting and abdominal pain. At laparotomy the surgeon should usually be able to "milk on" worms to the caecum. Whenever possible, one should always avoid incising the bowel, for it is difficult to prevent squirming worms from soiling the peritoneum, and subsequently the wall is sutured with permanent sutures lest a few worms wriggle through.

Acute peritonitis may occur, even without a preceding operation; perforations, sometimes multiple, are seen and many worms may be found in the abdominal cavity. This is a rare complication (Heywood and Youngleson, 1957). *Migration* of roundworms to unusual sites such as the bile ducts is quite infrequent. *Nervous and toxaemic* symptoms of fever, irritability and convulsions may undoubtedly occur, the cerebrospinal fluid is normal in life and the brain shows no abnormality at *post-mortem*. It is an uncommon but puzzling phenomenon. *Haemoptysis* and a few signs in the lung may occur when massive infection by larvae is occurring; it is almost impossible to establish the diagnosis with any certainty.

Diagnosis.—This depends on finding numerous ova in the stools in a child presenting symptoms consistent with the disease. Differentiation must be made from any mild cause of abdominal pain, vomiting and diarrhoea. Dysentery must be borne in mind, while the more serious emergencies of intussusception and appendicitis may be simulated.

Following a barium meal, ascaris may be demonstrated as "railway lines" in the small intestines; this examination is contra-indicated if obstruction is present.

Treatment.—Piperazine is effective and not toxic. There are different salts: adipate, citrate or phosphate. Children below 40 lb. body weight receive 3 g.; those over receive 4 g. as elixir or tablets. It is given as a single dose without preliminary starvation or subsequent purging. It is repeated after seven days if the stool still contains ova; oil of chenopodium and hexylresorcinol are less effective.

Intussusception

The infantile variety, which is always acute and usually ileo-caecal, is almost limited to infants aged three to nine months and commoner in boys; it is seen in African infants as in other races. It is not really common in any part of the world and its true incidence in Africa is not known, but all large hospitals have recorded cases. Many cases would die before aid is sought. It is easy to confuse the disease with dysentery, but the infant has more pain and collapse and a tumour should be palpable.

Secondary intussusception is a rare disease at any age, but occurs most in adults. The underlying cause is a tumour, which is usually benign, but other local lesions may occur.

Primary subacute intussusception is a disease almost limited to adults; no underlying cause can be found even at operation. It is a rare condition outside Africa. In Africans it is almost invariably the caput caecum variety; it is often subacute in its course.

It has apparently a most peculiar and unexplained geographical distribution. Thus at Ibadan (Joly and Thomas, 1954) this variety accounted for about 20 per cent. of all cases of acute obstruction and there were 31 cases of this type compared with only two seen in infants. It is the commonest variety at Kampala (Burkitt, 1952) and at Bukavu, Ruanda-Urundi, where 64 cases were described (Coutelier, 1955); but in Johannesburg, although probably unduly frequent in proportion to the age-groups at risk, the infantile variety is slightly more numerous (Skapinker, 1953).

A mobile caecum and ascending colon with a marked mesocolon are a *sine qua non;* the appendix is usually retro-caecal. The apex lies in the wall of the caecum on the lateral side of the anterior taenia; it is well away from the ileo-caecal valve.

Clinical Picture.—The condition is commonest in young African adolescents or adults aged 11 to 30 years. The history is different from that encountered in the infantile variety. Although most have a definite acute onset of colicky pain, referred to the central abdomen, many start in a more insidious manner. The tempo of the disease is slower in adults, many of whom have been ill for two to three weeks before seeking medical aid—in some cases it may be two to three months. Diarrhoea is more common than constipation; often the two alternate. The stools appear normal; blood is seen in only a third of the cases. Vomiting is intermittent and not severe unless complete obstruction supervenes. At times the condition may start as acutely as any other variety of obstruction. Wasting is obvious in those whose history extends to a few weeks, the abdomen remains soft and there is no tenderness except possibly over the mass. In four-fifths of the patients a mass is easily felt in the transverse colon. A straight X-ray is informative and shows an empty right abdomen.

Diagnosis is not difficult if the peculiarities and frequency of this variety are recognised; the mass may be mistaken for gastric or colonic carcinoma (rare in Africans), impacted ascaris (uncommon in adults) or splenomegaly; colic and diarrhoea may simulate dysentery or helminthiasis.

Treatment is by operation, for cases tend to arrive late at hospital. In view of the length of history, it is surprising how many are reducible. Some fixing of the caecum and shortening of the meso-colon appear desirable, although recurrence is said to be rare even when nothing has been done.

Volvulus

After strangulated hernia this is the commonest cause of intestinal obstruction in Uganda (10.1 per cent.), Rhodesia (33 per cent.), South Africa (15.3 per cent.), but not in Nigeria (1 per cent.) (Table II).

Volvulus of the Small Intestine.—This variety is possibly unduly frequent in areas of Kenya (Ken and Willis, 1946; Miller, 1955) and also in the South African mines (Dickson, 1950). This is a rare variety of volvulus in Britain in which only 85 cases were seen during six years, 1925-30, at 21 teaching hospitals (Vick, 1932). In Kenya, however, nine cases were seen in one district hospital at Kisumu and another seven cases in one year at Nairobi.

The clinical picture is that of a young adult in severe pain, which soon becomes continuous, with much vomiting and constipation, but little distension. Often over two-thirds of the small bowel are involved and the whole of the radix mesenterii acts as the pedicle. An early operation alone can save the person from this acute and serious form of obstruction.

Recurrent volvulus of the large bowel, usually that of the sigmoid, appears unduly frequent in Uganda (Burkitt, 1952), Central Africa and South Africa (Skapinker, 1953), but not apparently in Nigeria (Joly and Thomas, 1954). In America volvulus of the sigmoid colon is far commoner in Negroes than in whites (Pool and

Dunavant, 1951); it is said to be frequent in Russia and certain countries of Eastern Europe. In all parts of the world men are attacked much more often than women.

A *sine qua non* for volvulus of the sigmoid colon is a long loop with a short mesenteric base holding the two limbs in approximation. This occurs commonly in certain Africans, at least in Uganda. Scarring and adhesions around the base suggest that there have been several preceding attacks and a careful history reveals minor attacks of central abdominal pain, constipation and distension, followed by sudden relief and the passage of a bulky stool. The clinical picture varies in severity, but many have an insidious onset and are fairly fit in spite of gross abdominal distension. Those with gangrene have severe pain and look ill. The presence or absence of audible peristalsis is of little value in the diagnosis. A straight X-ray film of the abdomen reveals an enormously distended sigmoid, often extending right up to the liver and to the right of the mid-line; often there is a fluid level in the gut. The volvulus is usually anti-clockwise.

Treatment of the obstruction is by immediate operation; the volvulus is unwound and deflated by a rectal tube. A plastic operation is carried out to reduce the length of the meso-colon.

The mortality is high if gangrene has occurred. If a patient is seen in between the attacks of obstruction the diagnosis can be very difficult; the bouts of pain may suggest peptic ulcer or chronic pancreatitis. If a barium enema reveals an enormous sigmoid colon, laparotomy is justified if pain has been severe; the tell-tale white scarring at the base of the meso-colon and the size of the sigmoid flexure clinch the diagnosis.

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